I CLAIM:

1. A digital imaging apparatus comprising:
   a) a detector for generating a first signal in response to photons incident thereupon; and
   b) multimode readout circuitry coupled to said detector for receiving said first signal and for generating a second signal representative of said first signal, said multimode readout circuitry switchable between two or more modes of operation, a desired mode of operation determined based on characteristics of said first signal.

2. The digital imaging apparatus according to claim 1, wherein the characteristics of said first signal include magnitude of the first signal.

3. The digital imaging apparatus according to claim 2, wherein the magnitude is below a predetermined threshold and said desired mode of operation of the multimode readout circuitry includes amplification of the first signal for generating the second signal.

4. The digital imaging apparatus according to claim 1, wherein the multimode readout circuitry generates a second signal representative of said first signal in two or more modes of operation, thereby generating two or more second signals representative of the first signal.

5. The digital imaging apparatus according to claim 1, wherein said multimode readout circuitry is switchable between each of the two or more modes of operation by use of a manual switch.

6. The digital imaging apparatus according to claim 1, wherein said multimode readout circuitry is switchable between each of the two or more modes of operation by use of an automatic switch.

7. The digital imaging apparatus according to claim 6, wherein said automatic switch includes a feedback circuit.

8. The digital imaging apparatus according to claim 6, wherein said automatic switch is responsive to a pre-programmed sequence.

9. The digital imaging apparatus according to claim 1, wherein said readout circuitry further comprises a reconfigurable circuit having two or more configurations, each configuration of the reconfigurable circuit defining a particular mode of operation of the multimode readout circuitry.

10. The digital imaging apparatus according to claim 9, wherein said reconfigurable circuit can be configured to function as a circuit selected from the group comprising a charge amplifier circuit, a voltage amplifier circuit, a voltage buffer circuit, and a load circuit.

11. The digital imaging apparatus according to claim 1, further comprising one or more additional detectors, said one or more additional detectors coupled to the multimode readout circuitry.

12. The digital imaging apparatus according to claim 1, wherein said multimode readout circuitry includes two or more capacitors having varying capacitance values, said two or more capacitors being arranged in parallel and configured to be switched therebetween, thereby providing two or more gains.

13. The digital imaging apparatus according to claim 1, wherein the multimode readout circuitry comprises one or more transistors, said transistors being selected from the group comprising amorphous silicon TFTs, poly-crystalline silicon TFTs, micro-crystalline TFTs, nano-crystalline silicon TFTs and crystalline silicon transistors.

14. The digital imaging apparatus according to claim 1, wherein the multimode readout circuitry includes three modes of operation.

15. A digital imaging system comprising an array of digital imaging apparatuses, each digital imaging apparatus comprising:

a) a detector for generating a first signal in response to photons incident thereupon; and

b) multimode readout circuitry coupled to said detector for receiving said first signal and for generating a second signal representative of said first signal, said multimode readout circuitry switchable between two or more modes of operation, a desired mode of operation determined based on characteristics of said first signal.

16. The digital imaging system according to claim 15, wherein a particular group of two or more digital imaging apparatuses has a common portion of the multimode readout circuitry.

17. The digital imaging system according to 16, said system further comprising multiplexing circuitry enabling signals to be multiplexed to the common portion of the multimode readout circuitry.

18. The digital imaging system according to 16, wherein said multiplexing circuitry includes one or more multiplexers.

19. The digital imaging system according to 16, wherein said multiplexing circuitry includes one or more switching circuits.

20. A digital imaging apparatus comprising:

a) a detector for generating a first signal in response to photons incident thereupon; and

b) readout circuitry coupled to the detector for generating a second signal representative of said first signal, said readout circuitry including a current subtraction circuit for generating a desired signal, said readout circuitry combining said second signal and said desired signal, and said readout circuitry generating a third signal representative of the combined second signal and desired signal.

21. The digital imaging apparatus according to claim 20 wherein the readout circuitry is a multimode readout circuitry switchable between two or more modes

of operation, a desired mode of operation determined based on characteristics of said first signal.

22. Use of the digital imaging apparatus according to claims 1 or 20 for radiography or optical imaging.

23. Use of the digital imaging apparatus according to claims 22, wherein radiography includes fluoroscopy, chest radiography, and mammography.

24. Use of the digital imaging apparatus according to claims 23, wherein fluoroscopy includes real-time fluoroscopy.

25. A method for digital imaging comprising the steps of:

a) detecting by a detector photons incident thereupon;

b) generating by the detector a first signal in response to the photons;

c) receiving said first signal by multimode readout circuitry coupled to the detector;

d) generating a second signal representative of the first signal by the multimode readout circuitry, said multimode readout circuitry switchable between two or more modes of operation, a desired mode of operation determined based on characteristics of said first signal; and

e) transferring said second signal to a digital signal processor.

26. A method for digital imaging comprising the steps of:

a) detecting by a detector photons incident thereupon;

b) generating by the detector a first signal in response to the photons;

c) receiving said first signal by readout circuitry coupled to the detector;

d) generating a second signal representative of the first signal by the readout circuitry, said readout circuitry including a current subtraction circuit for generating a desired signal;

e) combining said second signal and said desired signal;

f) generating a third signal representative of the combined second signal and desired signal; and

g) transferring said third signal to a digital signal processor.